## DETAILED ACTION

## EXAMINER'S AMENDMENT

1.      An examiner's amendment to the record appears below. Should the changes

and/or additions be unacceptable to applicant, an amendment may be filed as provided

by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be

submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with

Larry Nixon on March 22, 2010.

2.      The application has been amended as follows:

**Amendment to the Claims:**

**Claim 1.** (Amended)   An image processing method for detecting objects within an input

image, the image being composed of picture elements, the method comprising:

a) segmenting picture elements representing a foreground object within the input image

from those picture elements forming the image background using a first segmentation

technique, wherein the picture elements segmented as foreground include elements

representing a shadow or highlight of the object;

b) storing a segmentation mask, containing the location of the segmented picture

elements representing a foreground object, in a data store;

c) segmenting picture elements which have the characteristics of a shadow or highlight

of an object from those picture elements representing the foreground object using at

least one other segmentation technique adapted to detect shadows or highlights;

d) segmenting as foreground surrounding picture elements to those picture elements

which are already segmented as foreground by performing a morphological ~~dilution~~

**dilation** operation;

e) comparing the surrounding picture element segmented as foreground in step d)

against the stored segmentation mask;

f) repeating steps d) and e) if comparison determines that the segmented surrounding

picture elements do not touch the boundary of the foreground object in the stored

segmentation mask; and

g) if the comparison determines that the segmented surrounding picture elements touch

the boundary of the foreground object in the stored segmentation mask, then detecting

as objects, groups of adjacent picture elements which have been segmented as

foreground.


**Claim 3.** (Amended)   A **non-transitory** computer-readable storage medium containing

a computer program or suite of computer programs arranged such that, when executed

by a computer, they control the computer to perform the method of claim 1.


**Claim 5.** (Amended)  An image processing system for detecting objects within an input

image, the image being composed of picture elements, the system comprising:

a data store;

an image processor arranged to receive an input image to be processed, and to apply the following image processing operations thereto:

a) to segment picture elements representing a foreground or moving object within the input image from those picture elements forming the image background using a first segmentation technique adapted to detect differences in the input image from a general background image, wherein the picture elements segmented as foreground include elements representing a shadow or highlight of the object;

b) to store a segmentation mask, containing the location of the segmented picture elements representing a foreground object in the data store;

c) to segment picture elements which have the characteristics of a shadow or highlight of an object from those picture elements representing the foreground object using at least one other segmentation technique adapted to detect shadows or highlights;

d) to repeatedly segment as foreground surrounding picture elements to those picture elements already segmented as foreground using a morphological ~~dilution~~ **dilation** operation

e) to compare the surrounding picture elements segmented as foreground in step ~~c)~~ **d)** against the stored segmentation mask;

f) to stop the morphological ~~dilution~~ **dilation** operation if the comparison determines that segmented surrounding picture elements touch the boundary of the foreground object in the stored segmentation mask; and then

g) to detect as objects, groups of adjacent picture elements which have been

segmented as foreground.


**Allowable Subject Matter**


3.      **Claims 1 and 5 as amended are allowed.**

4.      **Claims 2 and 6, by virtue of their dependencies on the previously identified**

**allowed claims, are allowed.**

5.      **Claim 3, as amended and by virtue of its dependency on the previously**

**identified allowed claim, is allowed.**


The following is an examiner's statement of reasons for allowance: segmenting picture

elements representing a foreground object within the input image from those picture

elements forming the image background using a first segmentation technique, wherein

the picture elements segmented as foreground include elements representing a shadow

or highlight of the object; storing a segmentation mask, containing the location of the

segmented picture elements representing a foreground object, in a data store;

segmenting picture elements which have the characteristics of a shadow or highlight of

an object from those picture elements representing the foreground object using at least

one other segmentation technique adapted to detect shadows or highlights;

segmenting as foreground surrounding picture elements to those picture elements

which are already segmented as foreground by performing a morphological dilation

operation;  comparing the surrounding picture element segmented as foreground in the

previous step, against the stored segmentation mask; repeating the prior two steps if

comparison determines that the segmented surrounding picture elements do not touch

the boundary of the foreground object in the stored segmentation mask; and if the

comparison determines that the segmented surrounding picture elements touch the

boundary of the foreground object in the stored segmentation mask, then detecting as

objects, groups of adjacent picture elements which have been segmented as

foreground, is not taught by the prior art.

Any comments considered necessary by applicant must be submitted no later

than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee.  Such submissions should be clearly labeled "Comments on

Statement of Reasons for Allowance."


## Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to THOMAS A. CONWAY whose telephone number is

(571)270-5851.  The examiner can normally be reached on Monday through Friday

8AM - 5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bella Matthew can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas A. Conway/
Examiner, Art Unit 2624

/Tom Y Lu/
Primary Examiner, Art Unit 2624